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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TALBOT, BRIAN K	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/719,014	ISSAEV ET AL.	
	Examiner	Art Unit	
	Brian K. Talbot	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,22-25,27-34,37-39,41-50 and 52-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,22-25,27-34,37-39,41-50 and 52-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/4/08 has been entered.

2. Claims 21,26,35,40 and 51 have been canceled. Claims 61-64 have been added. Claims 1-20,22-25,27-34,37-39,41-50 and 52-64 remain in the application.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. In light of the amendment filed 3/4/08, the 35 USC 112 rejection over claim 36 has been withdrawn.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claims are directed toward a method of making a cathode for a battery by coating and not directed toward a battery including coated aluminum components.

Claim Rejections - 35 USC § 103

Claims 1-20,22-25,27-34,37-39,41-50 and 52-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) still further in combination with Marincic et al. (5,554,463) (a) alone or (b) further in combination with Sakamoto et al. (6,447,957).

Takeuchi et al. (5,543,249) teaches an aqueous blended electrode material for use in electrochemical cells and manufacture. Takeuchi et al. (5,543,249) teaches forming cathode powder mixture, spreading onto an expanded metal grid and calendaring to form the cathode laminate. The laminate is then heated and cut to size and rolled to final thickness (Fig. 2 and col. 3, line 25 – col. 4, line 5). The cathode active material includes, fluorinated carbon, manganese dioxide, iron disulfide, etc (col. 2, lines 40-58). A polymer binder is added to the cathode active material as well as the carbon material to form the cathode active material. The expanded metal screen or grid is preferably aluminum (col. 3, line 45). Takeuchi et al. (5,543,249) teaches that slurry application is also known (col. 1, line 25-55).

Takeuchi et al. (5,543,249) fails to teach a current collector that includes pulling the grid having an initial tensile strength and increasing the tensile strength by the pulling step.

Michel et al. (2004/0264110) teaches electrodes and production thereof whereby an aluminum current collector is stretched prior to application of a cathode active material ([0013]-[0026] and [0036]). The perforations (5) are square, i.e. diamond-shaped as depicted in Figs. 2-5.

Therefore it would have been obvious to have modified Takeuchi et al. (5,543,249) battery to include a current collector that is pulled prior to coating with the cathode active material as evidenced by Michel et al. (2004/0264110) with the expectation of achieving the benefits associated therewith, i.e. increased surface area and tensile strength.

Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) fails to teach a tensile strength of the pulled grid to be greater than 5 lb/in as well as the claimed 6061 aluminum alloy grid.

Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) discloses a positive current collector for a battery comprising a 6061 aluminum alloy (See Introduction and Table 1). Examiner's note: A 6061 aluminum alloy has the following properties: tensile strength of 18100 psi, yield strength of 7980 psi, and a resistivity of 3.7e-006 ohm-cm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) battery to include a current collector that includes an aluminum alloy that is a 6000 series aluminum alloy including 0.04-0.4% by weight of chromium, 0.01-6.8% by weight of copper, 0.1-7% by weight of magnesium, 0.15% or less by weight of manganese, and 0.4-0.8% by weight of silicon; an aluminum alloy including 0.15-0.4% by weight of copper, 0.7% or

less by weight of iron, 0.8-1.2% by weight of magnesium, 0.1% or less by weight of titanium, and 0.25% or less by weight of zinc; a current collector that has a yield strength of at least 2.0 lb/in; a current collector that has a yield strength of at least 5 lb/in; a current collector that has a tensile strength of at least 5 lb/in; a current collector that has a tensile strength of at least 7 lb/in; a current collector that has a yield strength of at least 2.0 lb/in and a tensile strength of at least 5 lb/in; a current collector that has a resistivity of less than 10 mΩ/cm; and a current collector including a 6061 aluminum alloy as evidenced by Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) in order to utilize an aluminum alloy that is highly corrosion resistant even at high temperatures.

With respect to the leveling, it is the Examiner's position that when the collector is stretched it also is leveled.

Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) fail to teach pulling along a direction other than the length of any boundary of the diamond shaped grid.

Marincic et al. (5,554,463) teaches a current collector for electrochemical cell whereby a current collector having diamond-shaped grid is pulled or stretched along a direction other that the length of any boundary of the diamond shaped grid (Fig. 1 and col. 6-18).

Therefore it would have been obvious at the time the invention was made to have modified Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) process by pulling/stretching the grid in

the claimed direction as evidenced by Marincic et al. (5,554,463) with the expectation of achieving similar success.

(b) Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) still further in combination with Marincic et al. (5,554,463) fails to explicitly teach diamond-shaped perforation in the current collector.

Features detailed above are incorporated here concerning Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) still further in combination with Marincic et al. (5,554,463) (a) alone are incorporated here.

Sakamoto et al. (6,447,957) teaches diamond-shaped perforations in a current collector (abstract and Figs. 1-3).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110) further in combination with Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) process by including diamond-shaped perforation in the current collector as evidence by Sakamoto et al. (6,447,957) with the expectation of achieving similar success.

Response to Amendment

6. Applicant's arguments with respect to claims 1-20,22-25,27-34,37-39,41-50 and 52-64 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued that the prior art fails to fail to teach pulling along a direction other than the length of any boundary of the diamond shaped grid.

Marincic et al. (5,554,463) teaches this limitation as detailed above.

Applicant argued that the leveling is different as it is done by rollers and not during the pulling/stretching step.

The Examiner recognizes the difference, however, the Examiner has taken the position that some type of "leveling" is achieved during the stretching/pulling process. Since the claims do not recite a "degree of leveling", the limitation is met by the references. It is noted Applicant recited grid thickness before and after leveling and if added to the claims would overcome this rejection. Applicant is reminded that all claims should be commensurate in scope with the arguments. Furthermore, Applicant argued the increase in tensile strength is achieved, however, it is the Examiner's position that the prior art would also achieve these values as the prior art utilizes the same grid with diamond-shaped holes and pulling in the same direction, i.e. increasing the short width dimension.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

//Brian K Talbot//
Primary Examiner, Art Unit 1792

BKT